

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Ju-hyung KIM et al.

Application No. 10/727,714

Group Art Unit: 1745

Confirmation No. 6907

Filed: December 5, 2003

Examiner: Keith D. Walker

For: PROTECTOR AND LITHIUM SECONDARY BATTERY HAVING THE SAME

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to the Appellant's earlier filed Notice of Appeal on November 13, 2007, Appellant hereby appeals to the Board of Patent Appeals and Interferences from the final rejection mailed August 22, 2007. The Appeal Brief is timely filed, the period for response being set to expire on January 13, 2008. Appellant submits this Appeal Brief along with the filing fee of \$500.00 set forth in 37 C.F.R. §41.20(b)(2).

Also enclosed is a Claims Appendix in compliance with 37 C.F.R. § 41.37(c)(1)(viii). An Evidence Appendix in compliance with 37 C.F.R. § 41.37(c)(1)(ix) is enclosed and indicated as being NONE. A Related Proceedings Appendix in compliance with 37 C.F.R. § 41.37(c)(1)(x) is enclosed and indicated as being NONE.

I. Real Party in Interest

Due to the assignment executed on December 1, 2003 by the inventors Ju-Hyung KIM and Un-Sick PARK and recorded in the United States Patent and Trademark Office at Reel

014765, Frame 0021, the real party in interest is as follows:

Samsung SDI Co., Ltd.
575 Sin-dong, Paldal-ku,
Suwon-city, Kyungki-do
Republic of Korea

II. Related Appeals and Interferences

Although the real party in interest has other appeals and interferences, none of the other pending appeals and interferences is believed to directly affect or be directly affected by, or have any bearing upon the decision of the Board of Patent Appeals and Interferences in this appeal.

III. Status of Claims

The status of the claims of the application is as follows:

Claims 12, 15 – 17, 20, 27, 28 and 35 - 38: rejected.

Claims 1 – 11, 13 – 14, 18 – 19, 21 – 26 and 29 - 34: canceled.

Claims 12, 15 – 17, 20, 27, 28 and 35 - 38 are the subject of this appeal.

IV. Status of Amendments

Claims 12, 15 – 17, 20, 27, 28 and 35 - 38 were rejected in the final Office Action mailed August 22, 2007.

No amendments were included in the Applicants' response dated October 10, 2007 in response to the final Office Action. Accordingly, there are currently no outstanding issues regarding the status of amendments.

A copy of the claims involved in the appeal is included in the Claims Appendix.

V. Summary of the claimed subject matter

Aspects of the present invention are directed to a lithium battery. In particular, the lithium battery according to claim 1 includes a generation element that generates electrical power (page

5, line 3) and a can to house the generation element (page 5, line 2). The can includes first and second surfaces, the first surface including a first terminal electrically connected to the generation element and the second surface including a second terminal electrically connected to the generation element (FIG. 4A). An output lead, made of a first material or an alloy thereof, is electrically coupled to the second terminal (FIG. 4A and page 7, line 11); A first lead, which electrically coupled to the first terminal, includes a layer of the first material or an alloy thereof and a cladding layer made of a second material or an alloy thereof (FIG. 5A, FIG. 5B). A safety device is electrically coupled to both the output lead and the first lead (FIGS. 3 – 6). The safety device comprises a portion of the first lead where the cladding layer of the first lead is connected to the can, a positive temperature coefficient (PTC) element, adjacent to the portion of the first lead such that the PTC element is separated from the can by the portion of the first lead, to interrupt a current between the output lead and the first lead upon a temperature and/or a voltage increase in the can, and an extension of the first material or an alloy thereof of the output lead adjacent to the PTC element (page 7, lines 1 – 14).

The lithium battery according to claim 38 includes a generation element to generate electrical power housed in a can including first and second terminals electrically coupled to the generation element (page 5, lines 1 – 7 and FIG. 4A). The battery includes an output lead, made of a first material or an alloy thereof, electrically coupled to the second terminal (FIG. 4A and page 7, line 11); a first lead, electrically coupled to the first terminal, including a layer of the first material or an alloy thereof and a cladding layer made of a second material or an alloy thereof (FIG. 5A, FIG. 5B); and a safety device that is electrically coupled to both the output lead and the first lead (FIGS. 3 – 6). The safety device includes a portion of the first lead where the cladding layer of the first lead is connected to the can, a positive temperature coefficient (PTC) element, adjacent to the portion of the first lead such that the PTC element is separated from the can by the portion of the first lead, to interrupt a current between the output lead and the first lead upon

a temperature and/or a voltage increase in the can, and an extension of the first material or an alloy thereof of the output lead adjacent to the PTC element (page 7, lines 1 – 14).

VI. Grounds of rejection

The following is a concise statement of each ground of appeal.

1. Whether claims 12, 15 – 17, 20, 27, 28 and 35 - 38 are patentable under 35 U.S.C. §103 over Watanabe (U.S. Patent No. 6,492,058) in view of Morishita (U.S. Patent No. 5,976,729) and Pedicini (U.S. Patent No. 5,188,909); and

VII. Arguments

1. **Claims 12, 15 – 17, 20, 27, 28 and 35 - 38 are patentably distinguishable over Watanabe (U.S. Patent No. 6,492,058), Morishita (U.S. Patent No. 5,976,729) and Pedicini (U.S. Patent No. 5,188,909).**

The combination of Watanabe, Morishita and Pedicini does not teach or suggest all of the express limitations of claims 12, 15 – 17, 20, 27, 28 and 35 - 38

As reiterated by the Supreme Court in KSR International Co. v. Teleflex Inc., 127 S.Ct 1727, 82 USPQ2d 1385 (U.S. 2007), the framework for the objective analysis for determining obviousness under 35 U.S.C. §103 is based on the underlying factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148, 148 USPQ 459 (U.S. 1966). These factual inquiries are the scope and content of the prior art, the differences between the prior art and the claims at issue and the level of ordinary skill in the pertinent art. (see also, "Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc.", 72 Fed. Reg. 57527 (Wednesday, October 10, 2007)), wherein it was stated that "Factual findings made by Office personnel are the necessary underpinnings to establish obviousness."

In the Office Action of August 22, 2007, the Examiner made numerous, specific factual errors regarding the scope and content of the prior art and the differences between the prior art and the claims that undermine his allegations of obviousness such that the Examiner has failed

to establish a *prima facie* case of obviousness.

As review, independent claim 12 relates to a lithium battery comprising a generation element that generates electrical power; a can to house the generation element, the can including first and second surfaces, the first surface including a first terminal electrically connected to the generation element and the second surface including a second terminal electrically connected to the generation element; an output lead, made of a first material or an alloy thereof, electrically coupled to the second terminal; a first lead, electrically coupled to the first terminal, including a layer of the first material or an alloy thereof and a cladding layer made of a second material or an alloy thereof; and a safety device that is electrically coupled to both the output lead and the first lead, the safety device comprising a portion of the first lead where the cladding layer of the first lead is connected to the can, a positive temperature coefficient (PTC) element, adjacent to the portion of the first lead such that the PTC element is separated from the can by the portion of the first lead, to interrupt a current between the output lead and the first lead upon a temperature and/or a voltage increase in the can, and an extension of the first material or an alloy thereof of the output lead adjacent to the PTC element. Similarly, independent claim 38 relates to a lithium battery including a generation element to generate electrical power housed in a can including first and second terminals electrically coupled to the generation element and also comprising the output lead, first lead and safety device, recited in the same terms as in claim 12.

Contrary to what is alleged by the Examiner, Watanabe, Morishita and Pedicini, singly or combined, do not teach or suggest all of the limitations of independent claims 12 and 38. In particular, Watanabe, Morishita and Pedicini, singly or combined, do not describe a first lead electrically coupled to a first terminal, the first lead including a layer of a first material or an alloy thereof and a cladding layer made of a second material or an alloy thereof and wherein the cladding layer is connected to the can, as recited by independent claims 12 and 38. Watanabe

describes a lead that connects a PTC device to a battery electrode terminal. However, as acknowledged by the Examiner, Watanabe is silent regarding the composition of the lead. Moreover, contrary to what is alleged by the Examiner in the Office Action of August 22, 2007, Morishita does not describe a lead including a layer of a first material or an alloy thereof and a cladding layer made of a second material or an alloy thereof. The "lead plate" mentioned by the Examiner is not a lead itself, but instead is a plate structure that attached to the bottom of the can of Morishita and to which a lead is attached (see, for example, FIG. 7 of Morishita). Therefore, Morishita does not describe a lead that includes a first material and a cladding layer made of a second material and that is coupled to the first terminal. The Examiner's reliance on in re Leshin, 125 U.S.P.Q. 416 (CCPA 1960) is inapposite. In in re Leshin, the material in question, plastic, was selected for use in the claimed container-dispenser for cosmetics based on its known suitability for the applicant's intended purpose, and this selection was found to be obvious based on references showing the use of plastic for container-dispensers for cosmetics. In the present application, the Morishita reference does not teach the suitability of a two-layer clad material for a lead, as opposed to for a bottom plate. Further, the third reference cited by the Examiner, Pedicini, does not mention a lead at all. Therefore, Applicants respectfully submit that there is no basis for a *prima facie* case of obviousness of the present claims over Watanabe, Morishita and Pedicini, since there is no art recognized suitability of a composition including a layer of a first material or an alloy thereof and a cladding layer made of a second material or an alloy thereof for a lead connecting a battery electrode terminal and a PTC element as alleged by the Examiner.

Moreover, independent claims 23 and 38 recite that the PTC element is separated from the can by the portion of the first lead. Watanabe, Morishita and Pedicini, singly or combined, do not describe this feature. Contrary to what is alleged by the Examiner in the Office Action of August 22, 2007, Watanabe does not teach locating a PTC element away from the battery. The

device 103 of FIG. 1 of Watanabe is not a PTC element, but rather is a protection circuit using a switching device such as a field effect transistor (see col. 1, lines 15 – 28 of Watanabe). Moreover, Watanabe explicitly states that its PTC device 13 is disposed in contact with the battery surface. (col. 8, lines 44 – 45 of Watanabe). The Examiner recognizes that this placement allows heat from the battery to be transmitted to the PTC element quickly and without any insulation effects from other components and that placement away from the battery would create a change the time frame and the amount of heat required to activate the PTC element. However, in the absence of the disclosure of the present application, the Examiner does not provide any reason why a person skilled in the art would consider relocating the PTC element away from direct contact with the battery case. Moreover, Morishita does not describe a PTC element at all; therefore, contrary to what is alleged by the Examiner, Morishita does not teach locating a PTC element on top of a lead. Accordingly, there is no teaching in the references, singly or combined, to locate the PTC element anywhere besides in contact with the battery case, such as is shown in FIG. 10 of Watanabe.

Accordingly, Watanabe, Morishita and Pedicini, singly or combined, do not teach or suggest all of the features of claims 12, 15 – 17, 20, 27, 28 and 35 – 38, and therefore, the rejection of claims 12, 15 – 17, 20, 27, 28 and 35 – 38 under 35 U.S.C. §103 over Watanabe (U.S. Patent No. 6,492,058) in view of Morishita (U.S. Patent No. 5,976,729) and Pedicini (U.S. Patent No. 5,188,909) should be reversed.

VIII. Conclusion

In view of the law and facts stated herein, the Appellant respectfully submits that the Examiner has failed to cite a reference or combination of references sufficient to maintain obviousness rejections of the rejected claims and has failed to rebut the arguments in the Amendment dated October 10, 2007 and in the applicants' previous responses.

For all the foregoing reasons, the Appellant respectfully submits that the cited prior art does not teach or suggest the presently claimed invention. The claims are patentable over the prior art of record and the Examiner's findings of unpatentability regarding claims 12, 15 – 17, 20, 27, 28 and 35 – 38 should be reversed.

The Commissioner is hereby authorized to charge any additional fees required in connection with the filing of the Appeal Brief to our Deposit Account No. 50-3333.

Respectfully submitted,

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Date: Jan. 8, 2008

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IX. Claims Appendix

12. A lithium battery comprising:

a generation element which generates electrical power;

a can to house the generation element, the can including first and second surfaces, the first surface including a first terminal electrically connected to the generation element and the second surface including a second terminal electrically connected to the generation element;

an output lead, made of a first material or an alloy thereof, electrically coupled to the second terminal;

a first lead, electrically coupled to the first terminal, including a layer of the first material or an alloy thereof and a cladding layer made of a second material or an alloy thereof; and

a safety device that is electrically coupled to both the output lead and the first lead, the safety device comprising:

a portion of the first lead where the cladding layer of the first lead is connected to the can,

a positive temperature coefficient (PTC) element, adjacent to the portion of the first lead such that the PTC element is separated from the can by the portion of the first lead, to interrupt a current between the output lead and the first lead upon a temperature and/or a voltage increase in the can, and

an extension of the first material or an alloy thereof of the output lead adjacent to the PTC element.

15. The lithium battery of claim 12, further comprising a safety vent which exhausts internal gas when pressure inside the can increases past a predetermined level, the safety vent being at the second surface of the can.

16. The lithium battery of claim 15, wherein:
the can further comprises an opening through which the generation element is introduced into the can, and a cap which closes the opening, and
the safety vent is disposed on the cap.
17. The lithium battery of claim 12, wherein the safety device interrupts current flowing therethrough when a voltage of the battery sharply increases.
20. The lithium battery of claim 12, wherein the first lead further comprises a third lead plate electrically connecting the PTC element and the second terminal.
27. The lithium battery of claim 12, wherein the first lead is attached to the first surface using ultrasonic welding.
28. The lithium battery of claim 12, wherein the first lead is attached to the first surface using resistance welding.
35. The lithium battery of claim 12, wherein the first material comprises nickel and the second material comprises aluminum.
36. The lithium battery of claim 12, further comprising a protection circuit electrically coupled in series between a lead attached to the second terminal and the output lead to prevent over-charging and/or over-discharging.
37. The lithium battery of claim 35, wherein the protection circuit, the leads, and the

safety device are disposed exterior to the can.

38. A lithium battery including a generation element to generate electrical power housed in a can including first and second terminals electrically coupled to the generation element, the battery comprising:

an output lead, made of a first material or an alloy thereof, electrically coupled to the second terminal;

a first lead, electrically coupled to the first terminal, including a layer of the first material or an alloy thereof and a cladding layer made of a second material or an alloy thereof; and

a safety device that is electrically coupled to both the output lead and the first lead, the safety device comprising:

a portion of the first lead where the cladding layer of the first lead is connected to the can,

a positive temperature coefficient (PTC) element, adjacent to the portion of the first lead such that the PTC element is separated from the can by the portion of the first lead, to interrupt a current between the output lead and the first lead upon a temperature and/or a voltage increase in the can, and

an extension of the first material or an alloy thereof of the output lead adjacent to the PTC element.

X. Evidence Appendix

NONE

- XI. Related Proceedings Appendix
NONE